

CR-91 Event – Shelby County, AL  
Preliminary Air Monitoring Summary  
September 17, 2016 05:00 - 17:00

*Prepared by*  
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*On Behalf of Colonial Pipeline*



## Introduction

On September 9, 2016, the Center for Toxicology and Environmental Health, L.L.C. (CTEH®) initiated air monitoring in support of response efforts to the gasoline release in Shelby County, AL. This report presents the real-time air monitoring data recorded from September 17 2016 05:00 to September 17, 2016 17:00 CDT.

## Real-Time Air Monitoring<sup>1</sup>

Real-time air monitoring was conducted to evaluate the potential airborne presence of gasoline-associated constituents, if any, during response operations. All instrumentation was calibrated at least once per day or per manufacturer's recommendations. Target analytes were measured as total volatile organic compounds (VOCs), oxygen, benzene, and flammability as the percent of the lower explosive limit (LEL) using remote telemetering RAESystems® AreaRAEs, hand-held instruments such as RAESystems® MultiRAE Pro/Plus' and UltraRAEs, as well as Gastec® colorimetric detection tubes.

During this monitoring period, two LEL, six benzene, and 21 VOC action level exceedances were recorded during worker activity monitoring, including instantaneous VOC and benzene readings which were recorded above the action level. When necessary, workers egressed the area in accordance with the approved sampling and analysis plan.

**Table 1**, below, presents the results of real-time air monitoring using hand-held instruments. Maps of the incident site location and locations of hand-held real-time air monitoring readings are provided in **Appendix I**.

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<sup>1</sup> Real-time air monitoring refers to the use of hand-held instruments that provide near-instantaneous readings of an airborne chemical concentration without the need for laboratory analysis.

*Table 1: Hand-Held Real-Time Air Monitoring Summary<sup>1</sup>  
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Location Category	Analyte	Instrument	Count of Readings	Count of Detections	Range of Detections <sup>2,3</sup>
Worker Activity Monitoring	Benzene	UltraRAE	35	5	0.5 - 1.9 ppm
	%LEL	MultiRAE Plus	58	0	<1 %
		MultiRAE Pro	46	0	<1 %
	O <sub>2</sub>	MultiRAE Plus	3	2	20.9 - 20.9 %
		MultiRAE Pro	2	2	20.9 - 20.9 %
	VOCs	MultiRAE Plus	57	2	1.7 - 1.7 ppm
		MultiRAE Pro	57	16	0.2 - 159 ppm
	Benzene	UltraRAE	4	1	11.05 - 11.05 ppm
Site Characterization	LEL	MultiRAE Pro	8	5	4 - 25 %
	VOC	MultiRAE Pro	8	8	1 - 512 ppm

<sup>1</sup>Please Note: The data displayed in the above table has not undergone complete QC analysis and is presented in a preliminary format.

<sup>2</sup>Maximum detections preceded by the "<" symbol are considered non-detections below the instrument limit of detection (LoD) value to the right.

<sup>3</sup>Numbers are the raw values, no correction factors have been applied.

During this monitoring period remote telemetering equipment recorded 5445 detections of VOCs above the CTEH established action level of 30 ppm and 45 detections of LEL above the CTEH established action level of 10% (3% as raw values on LEL sensors).

**Table 2** (below) summarizes remote telemetering AreaRAE data for this monitoring period. For this reporting period AreaRAE monitoring data may contain drift events<sup>2</sup>. **Appendix I** and **Appendix II** include location maps and graphs for remote telemetering data, respectively. <sup>4</sup>

<sup>2</sup> Drift is defined as any interference in the PID's or electrochemical sensor's ability to accurately report the concentration of a chemical in the atmosphere. Humidity, rapid temperature changes, and compromised batteries are examples of common sources of drift.

Table 2: Remote Telemetry Real-time Air Monitoring Summary<sup>1,3</sup>

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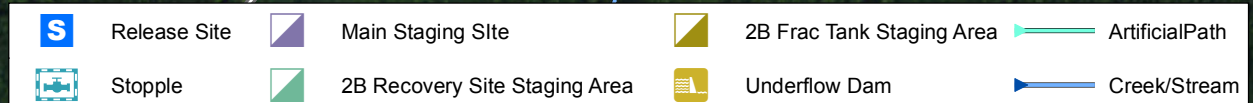
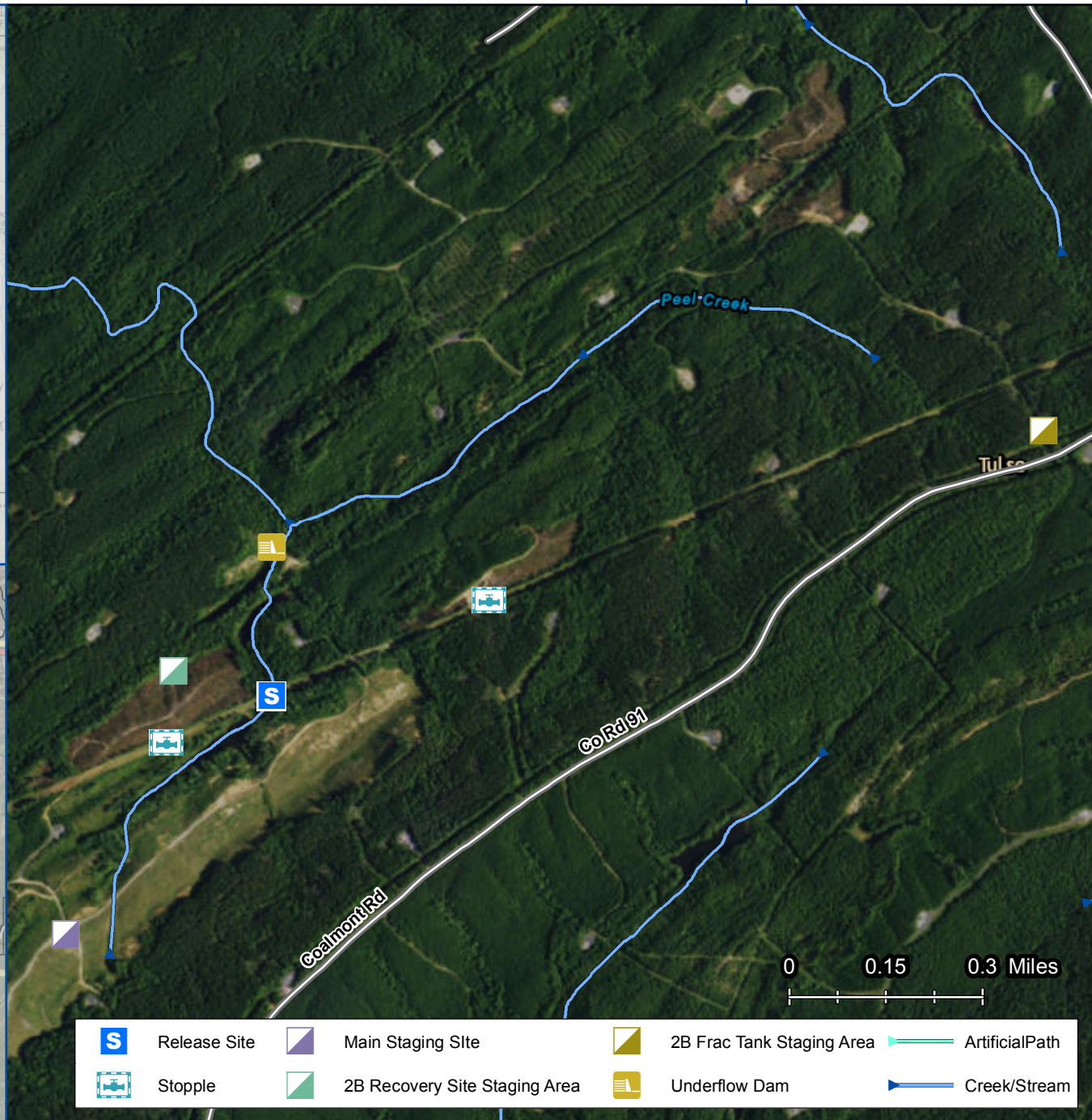
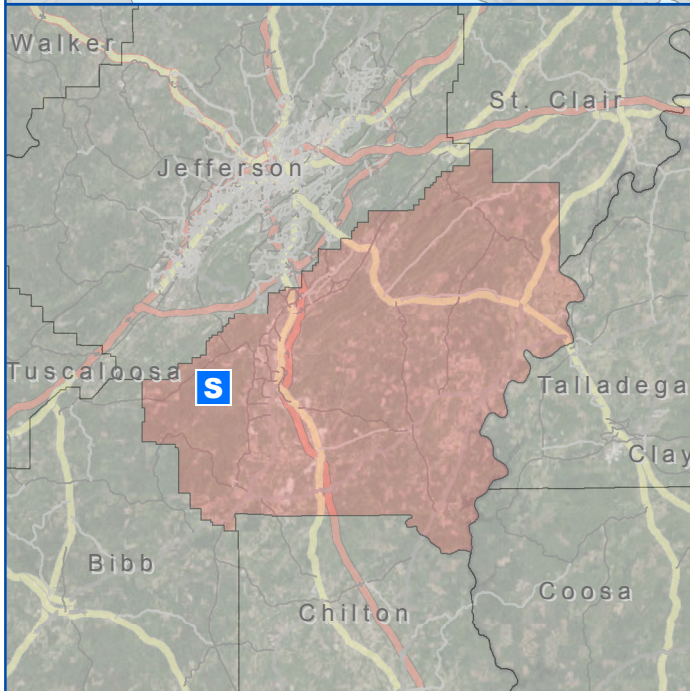
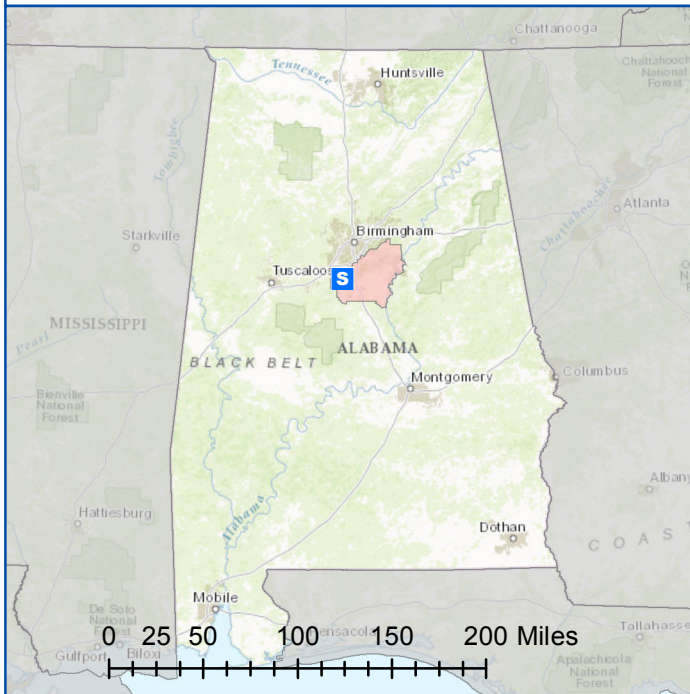
Unit	Location Description	Analyte	Count of Readings	Count of Detections	Range of Detections <sup>2</sup>
AR01	2A Compressors	LEL	2372	0	<1 %
		O <sub>2</sub>	2372	2372	20.9 - 20.9 %
		VOC	2372	2012	0.1 - 300.2 ppm
AR03	West of Release Site/Near Stopple 1	LEL	2489	0	<1 %
		O <sub>2</sub>	2489	2453	20.9 - 20.9 %
		VOC	2489	1608	0.1 - 4.6 ppm
AR04	2A Frac Tank Staging	LEL	2476	0	<1 %
		O <sub>2</sub>	2476	2476	20.9 - 20.9 %
		VOC	2476	909	0.1 - 6.8 ppm
AR05	2A Recovery	LEL	2527	3	1.3 - 3.1 %
		O <sub>2</sub>	2527	2527	20.9 - 21.4 %
		VOC	2527	1687	0.1 - 98.8 ppm
AR06	East of Release Site/Near Stopple 2	LEL	2319	0	<1 %
		O <sub>2</sub>	2319	2319	20.9 - 20.9 %
		VOC	2319	616	0.1 - 63.6 ppm
AR07	2B Recovery	LEL	2485	0	<1 %
		O <sub>2</sub>	2485	2485	20.9 - 21.2 %
		VOC	2485	1317	0.1 - 12.2 ppm
AR08	Main Staging Area Frac Tanks	LEL	2503	0	<1 %
		O <sub>2</sub>	2503	2503	20.4 - 20.9 %
		VOC	2503	2500	0.1 - 109.5 ppm
AR09	Release Site	LEL	2514	0	<1 %
		O <sub>2</sub>	2514	2514	20.9 - 20.9 %
		VOC	2514	525	0.1 - 71.1 ppm
AR10	On path between Recovery 2A and Recovery 2B.	LEL	2177	0	<1 %
		O <sub>2</sub>	2177	2101	20.9 - 21.3 %
		VOC	2177	0	<0.1 ppm
AR11	Main Staging Entrance East of TRG checkpoint	LEL	2090	0	<1 %
		O <sub>2</sub>	54	54	20.9 - 20.9 %
		VOC	2090	107	0.1 - 0.4 ppm
AR13	TRG Checkpoint 2 - access to stopple 1, Recovery 2A and 2A Frac Tank Staging Area.	LEL	2006	0	<1 %
		O <sub>2</sub>	2006	2006	20.9 - 20.9 %
		VOC	2006	2005	0.1 - 1.5 ppm
AR14	Cab of excavator at release site	LEL	2534	0	<1 %
		O <sub>2</sub>	2534	2534	20.9 - 20.9 %
		VOC	2534	2534	0.6 - 59 ppm

<sup>1</sup>Please note: The data displayed here has not undergone complete QA/QC analysis and is presented in a preliminary format.<sup>2</sup>Maximum detections preceded by the "<" symbol are considered at the limit of detection (LOD) value to the right.<sup>3</sup>LEL and VOC values are raw values, correction factors have not been applied.

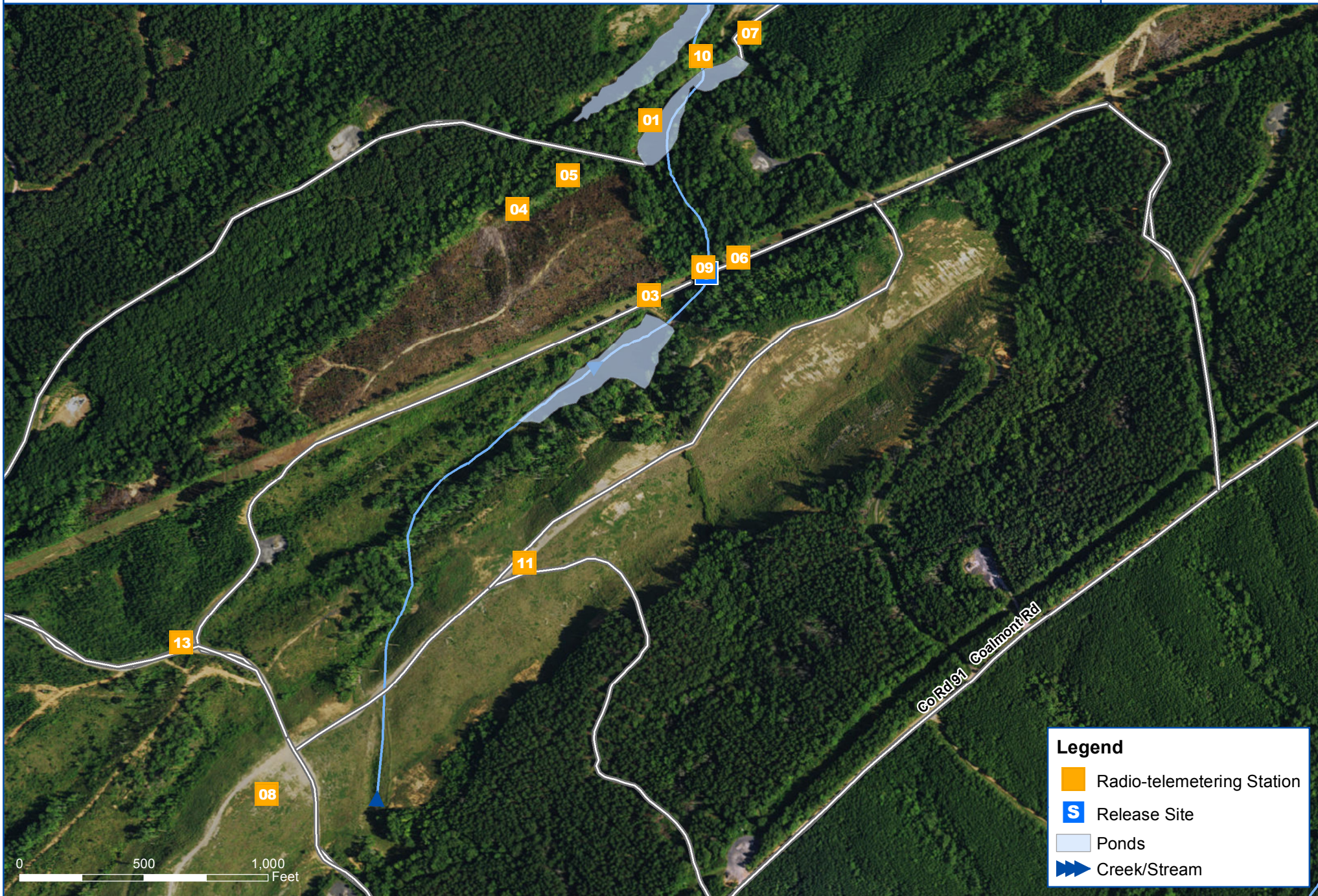


# Appendix I:

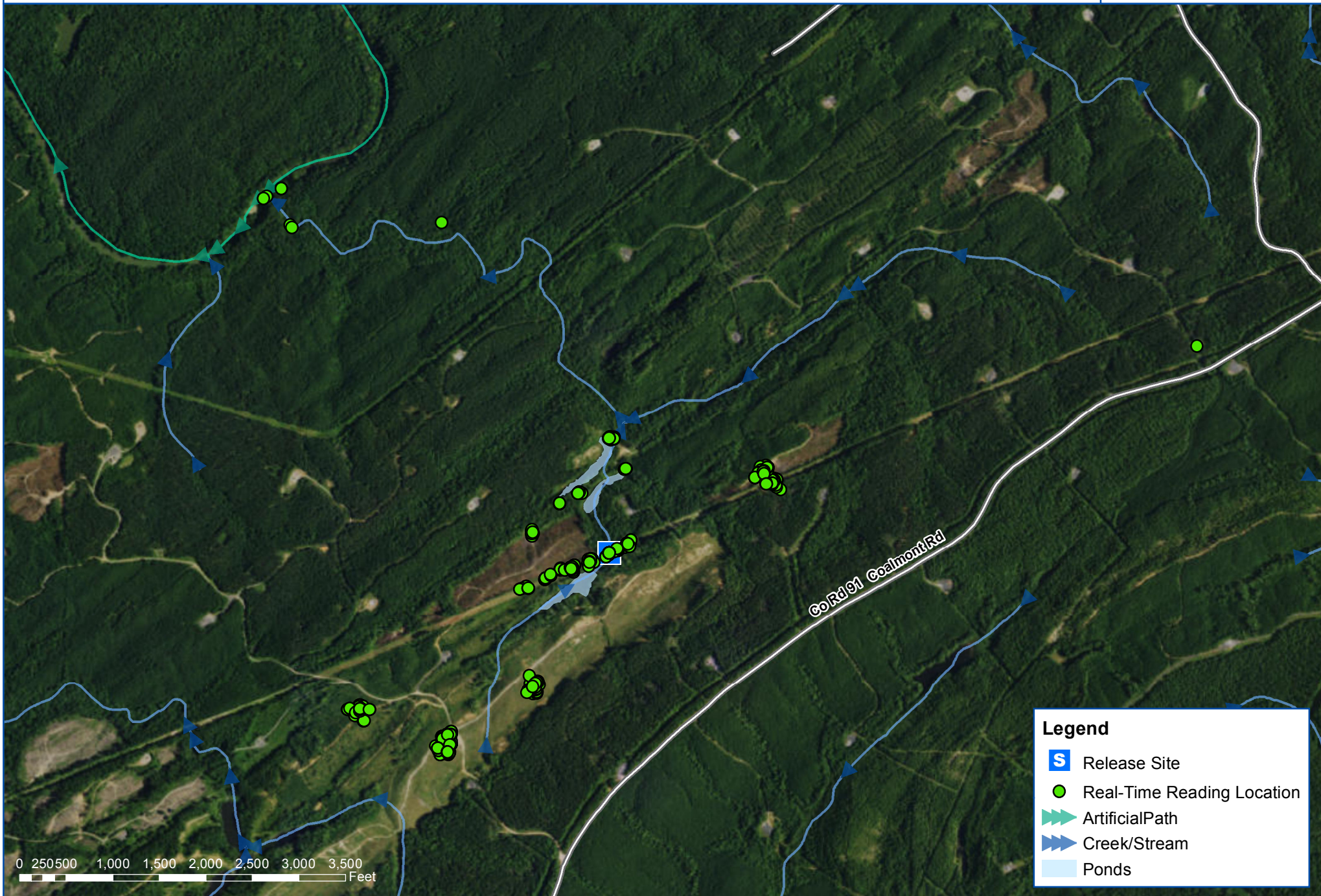
Site Location, Hand-Held Real-Time  
Air Monitoring Location, and  
Remote Telemetry Air Monitoring  
Location Maps



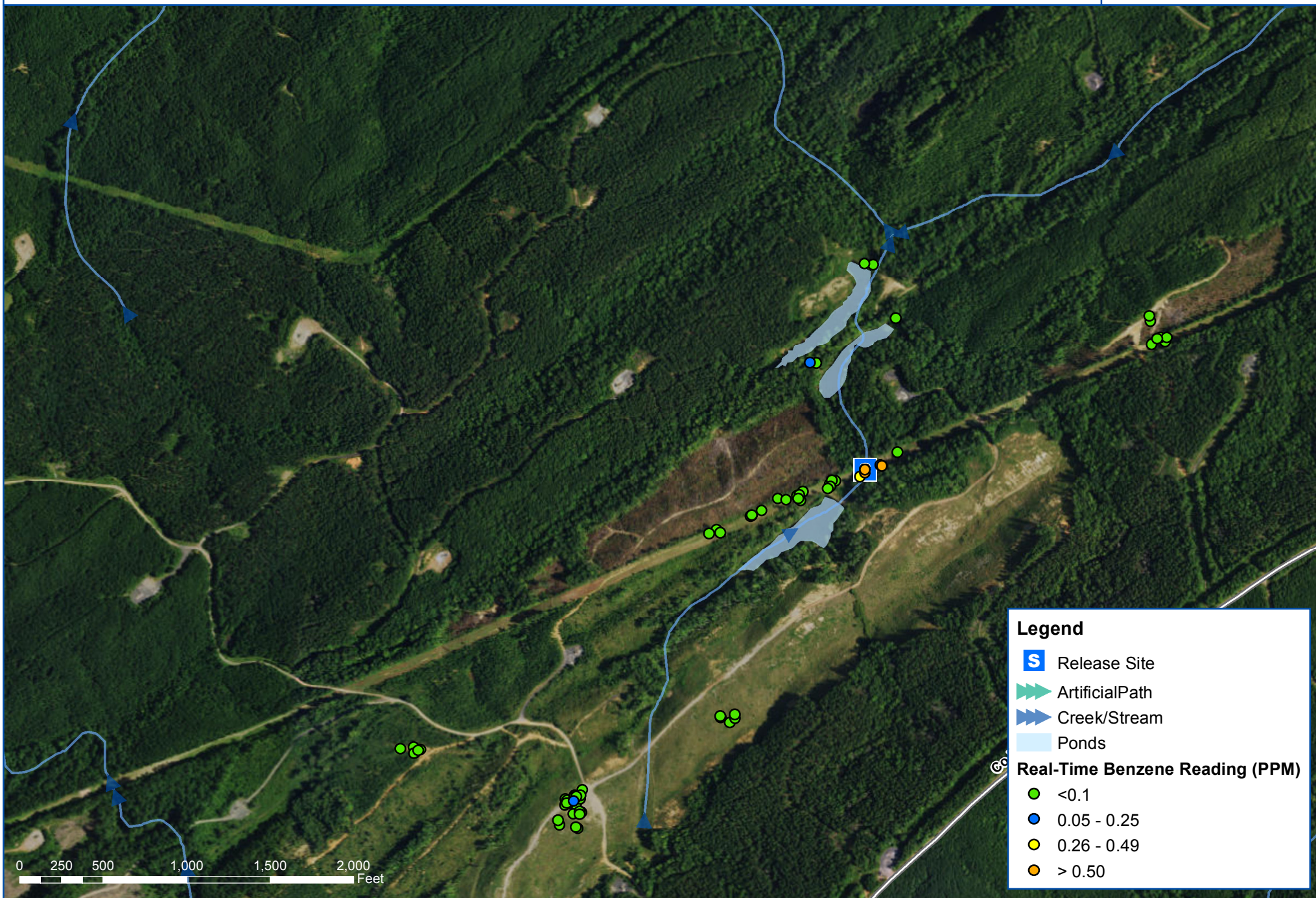




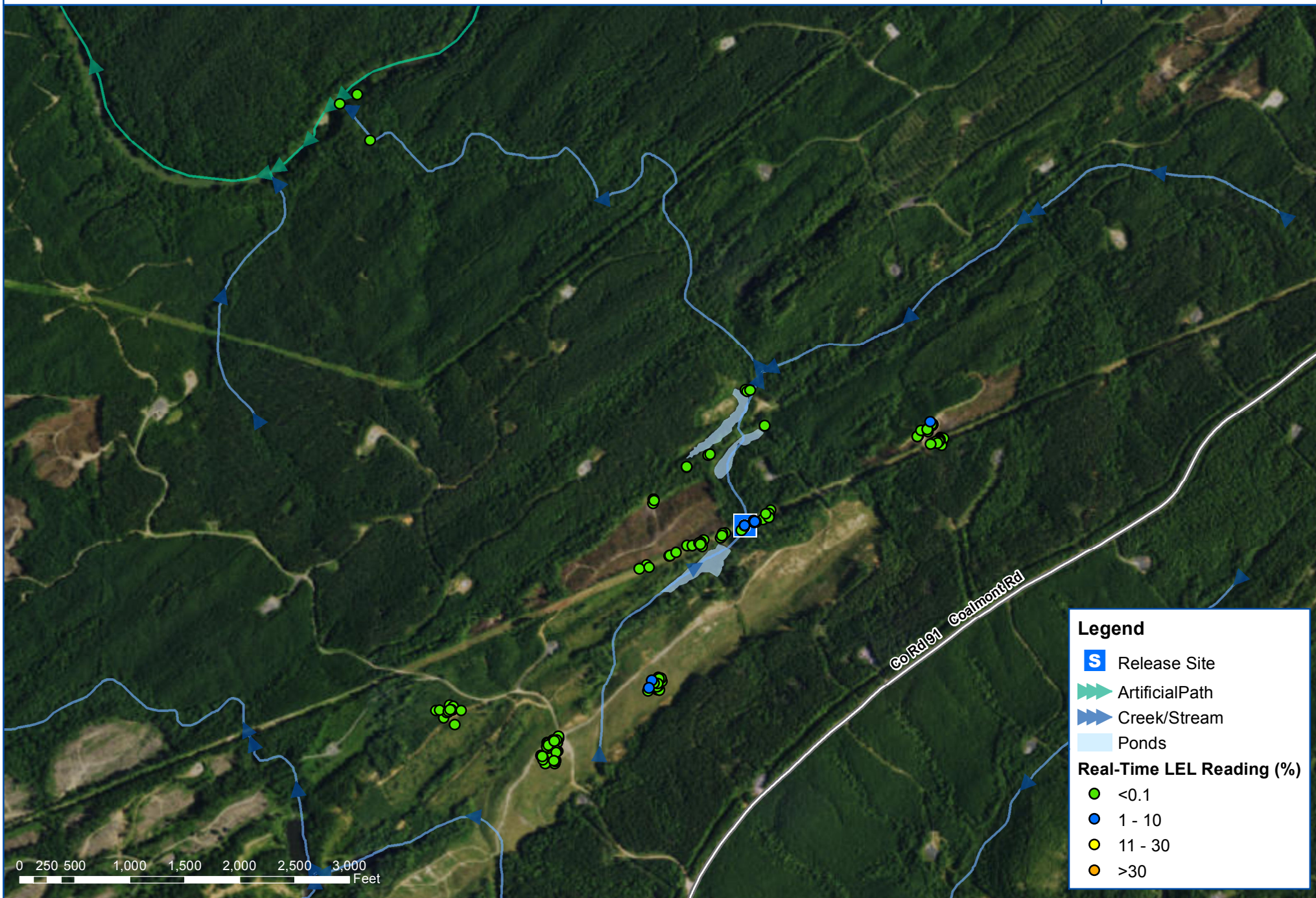




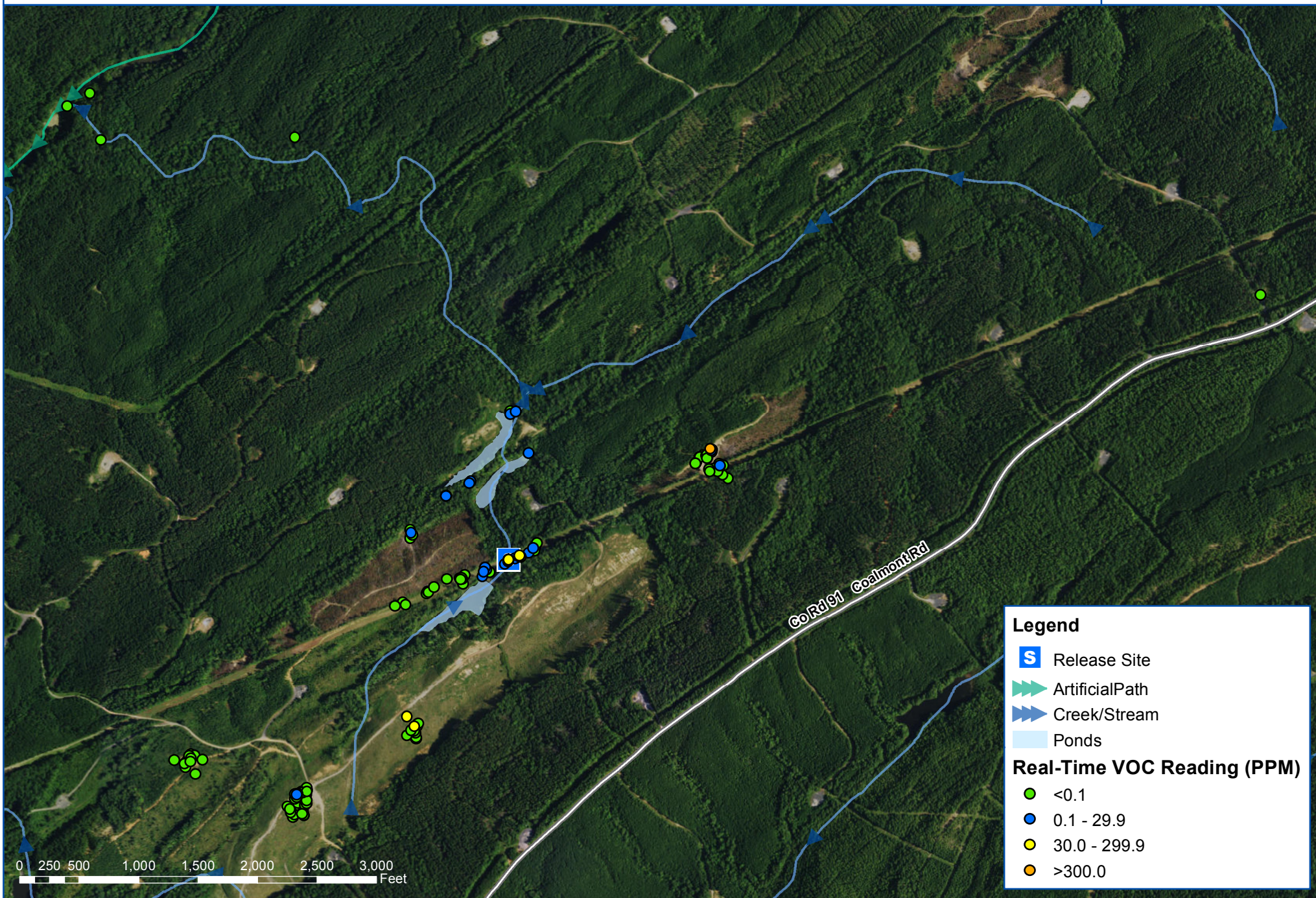














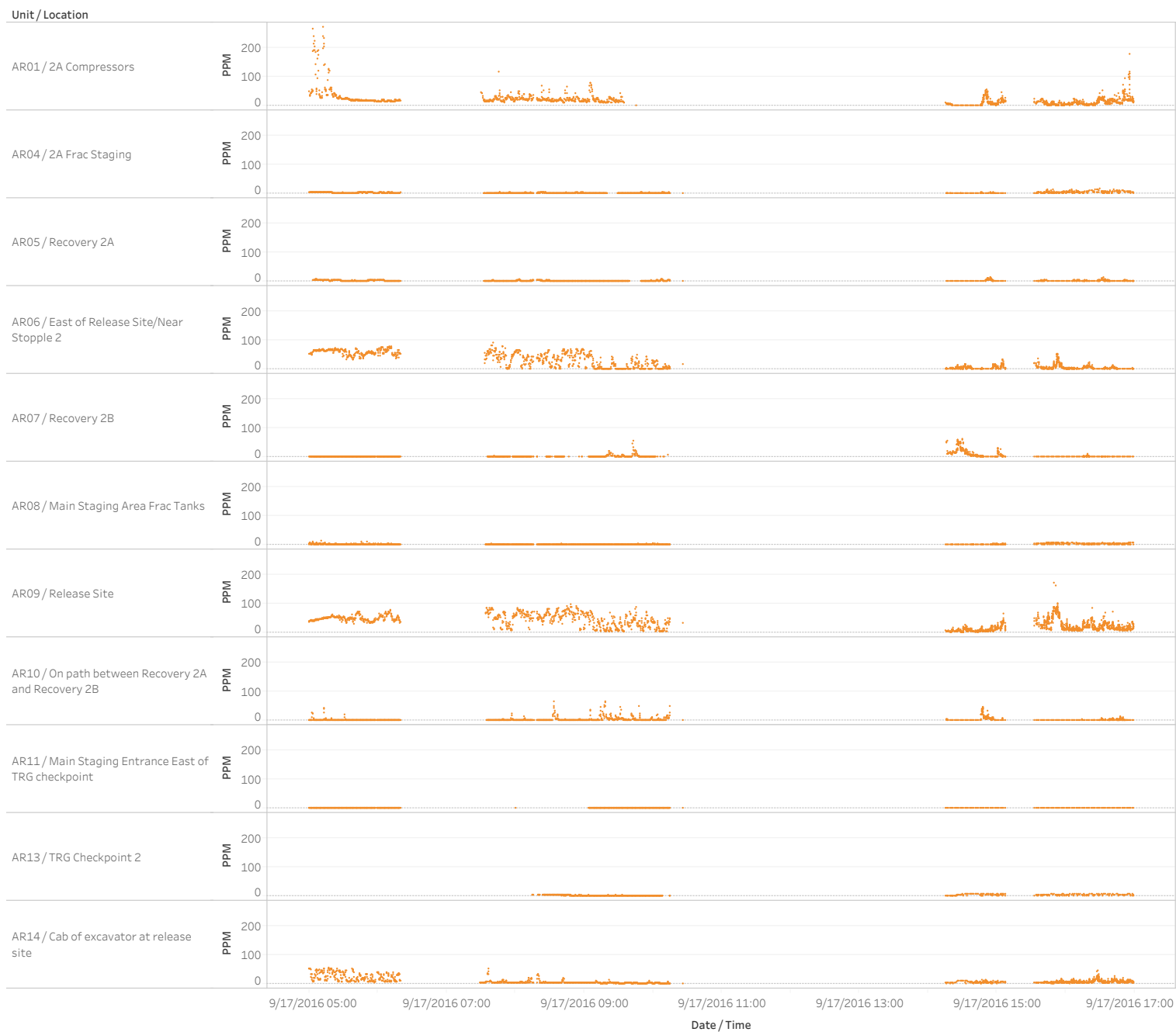
# Appendix II:

## Remote Telemetry Air Monitoring Graphs



## Remote Telemetry Real-time Air Monitoring | VOC

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VOC readings are a true representation of atmospheric conditions (appropriate correction factors have been applied to field values).

# Remote Telemetry Real-time Air Monitoring | LEL

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LEL readings are a true representation of atmospheric conditions (appropriate correction factors have been applied to field values).

# Remote Telemetry Real-time Air Monitoring | Oxygen

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